

REMARKS

Upon entry of the foregoing amendment, claims 1-8, 10-27 and 30-33 are pending in this patent application with claims 1, 8 and 18 being the independent claims. Claim 9 is canceled. New claims 32 and 33 are added.

Based on the amendment and following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Rejections Under 35 U.S.C. 112

The Examiner rejected claim 21 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserts that claim 21 is not clear as to what is meant by “takes advantage of” the natural phase relationship of the soundboard.

Applicant has amended claim 21 accordingly to clarify that a first sensor is located at a first position on the soundboard such that vibration of the first sensor is out of phase with vibration of a second sensor that is located at a second position on the soundboard during vibration at frequency due to the natural phase relationship of the soundboard. Support for the amendment may be found at page 15, lines 12-16 of the specification as originally filed.

Rejections Under 35 U.S.C. 102

The Examiner rejected claims 1-3, 7 and 18-24 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,535,668 to Schaller (“Schaller”). The Examiner states that Schaller discloses transducer that includes a housing (28) and a substantially cylindrical permanent magnet (34) with a side-to-side polarization.

Schaller discloses a magnetic pickup (10) that detects vibration of a string that is located near a portion of the pickup. The pickup (10) includes magnets (34) that are coupled to coil assemblies (32). Each magnet (34) "is glued to, press fitted with or otherwise fixed to" a coil bobbin 35 of the respective coil assembly (32). See Schaller col. 3, lines 20-22. As a result, there is no relative movement of the magnet (34) relative to the coil assembly (32). Instead, the magnet (34) produces a magnetic field that is channeled through pole pieces (20) and coil assemblies (32). The magnetic field is altered by vibration of the magnetic string near the pole piece and that alteration of the magnetic field is converted into current in the coil.

Claim 1, as amended, recites a magnet that is enclosed in a housing, wherein the housing and magnet are configured so that the magnet moves relative to a coil. The magnet is configured to have a side-to-side polar orientation

Claim 1 is not anticipated by Schaller. In order for a claim to be anticipated by a reference, the reference must teach each and every feature recited in the claim. See Verdegaal Bros. V. Union Oil Co. of California, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP § 2131. Schaller does not teach each and every element of claim 1 because it does not disclose a magnet that moves relative to a coil. Therefore, Schaller does not anticipate claim 1. Claims 2, 3 and 7 depend from and include all of the recited elements of claim 1 and, for at least the same reasons, are patentable over Schaller.

Claim 18, as amended, recites a sensor array for a musical instrument that includes one or more sensors for converting between mechanical vibration and electrical signal. Each sensor includes a transducer including a housing enclosing a substantially cylindrical permanent magnet, and a coil. The magnet is configured to have a side-to-side polar orientation and to move relative to the coil.

Schaller also does not teach each and every element recited in claim 18. As described above, Schaller fails to disclose a magnet that moves relative to a coil. Therefore, Schaller does not anticipate claim 18. Claims 19-24 depend from and include all of the recited features of claim 18 and, for at least the same reasons, are patentable over Schaller.

The Examiner rejected claims 1, 5, 6, 8, 9, 11-13, 16-18, 25-27, 30 and 31 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,922,753 to Idogaki *et al.* ("Idogaki").

Idogaki discloses an acceleration sensor that includes a housing (14), coils (4a, 4b, 5a, 5b) and a permanent magnet (2) suspended within the housing. The Examiner argues that the magnet of Idogaki has a side-to-side polar orientation based on a statement that the end faces of the magnet are the pole faces.

Claims 1, 8 and 18 recite a transducer that includes a cylindrical magnet configured so that the poles have a side-to-side configuration. Applicant asserts that the side-to-side orientation described in the specification is related to the cylindrical shape of the magnet, not the orientation of the figure as the examiner suggests. As described in the specification, the side-to-side configuration corresponds to each pole being shaped as a longitudinal portion of the cylindrical magnet. As a result, each pole has a wedge-shaped cross section as if cut from a cylinder along a plane parallel to the longitudinal axis of the cylinder. In fact, the magnet disclosed in Idogaki corresponds to the configuration of the magnet shown in FIG. 4 of the present application, which is designated as prior art. Idogaki fails to disclose a magnet having such a configuration because it teaches that each end face corresponds to a pole. As a result, Idogaki fails to recite each and every feature recited in each of claims 1, 8 and 18. Therefore, claims 1, 8 and 18 are not anticipated by Idogaki.

Claims 5 and 6 depend from and include all of the recited features of claim 1 and, for at least the same reasons, are patentable over Idogaki. Claims 11-13, 16 and 17 depend from and include all of the recited features of claim 8 and, for at least the same reasons, are patentable over Idogaki. Claims 25-27, 30 and 31 depend from and include all of the recited features of claim 18 and, for at least the same reasons, are patentable over Idogaki.

Rejections Under 35 U.S.C. 103(a)

Claims 3, 4, 10, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idogaki in view of U.S. Patent No. 4,338,823 to Iwasaki (“Iwasaki”). The Applicant respectfully traverses the rejection.

Claims 3 and 4 depend from and include all of the recited features of claim 1. Claims 10, 14 and 15 depend from and include all of the recited features of claim 8. As described above, claims 1 and 8 are patentable over Idogaki because that reference fails to disclose a cylindrical permanent magnet that has a side-to-side polar orientation. In order for this rejection of claims 3, 4, 10, 14 and 15 to be proper, Iwasaki would have to provide a teaching or suggestion of the recited features missing in Idogaki.

Iwasaki also fails to provide a teaching of a cylindrical permanent magnet that has a side-to-side polar orientation. The Examiner asserts “[t]he magnet (5) of Iwasaki will inherently induce a side-to-side polarization in the ferromagnetic material (19), this is deemed to be functionally equivalent to that of the Applicant’s magnet polarization.” Although case law supports the use of “functional equivalence” to provide a motivation to modify the teaching of a reference, there is no support for using that same rationale to insert a structural feature that is not disclosed in either of the cited references.

The Examiner argues that the magnet of Iwasaki, which does not have a side-to-side polar orientation, will induce a side-to-side polarization in a ferromagnetic material. Assuming arguendo that the Examiner's argument is technically correct, the ferromagnetic material is not a cylindrical permanent magnet so it does not have poles that are oriented in a side-to-side configuration. As a result, the reference fails to teach or suggest that recited feature. Because both references fail to provide any teaching or suggestion of a cylindrical permanent magnet having a side-to-side polar orientation, claims 3, 4, 10, 14 and 15 are patentable over the combination of Idogaki and Iwasaki.

New Claims 32 and 33

New claims 32 and 33 correspond to claims 14 and 15 as originally filed. The Examiner rejected claims 14 and 15 under 35 U.S.C. § 103(a) as being unpatentable over Idogaki in view of Iwasaki. As a result, the Applicant addresses the rejection with respect to new claims 32 and 33. The Examiner admits that neither Idogaki nor Iwasaki disclose the use of a metal insert for preventing the magnet from freely spinning. The Examiner asserts, however, that Idogaki discloses the need to stabilize the movement and position of the magnet and further asserts that it would have been obvious to one of ordinary skill in the art to add a metal insert to the device of Idogaki to prevent free spinning of the magnet.

The Examiner clearly stated that neither Idogaki nor Iwasaki disclose a metal insert as recited by claim 32. A requisite of providing a prima facie case is that the cited references must teach or suggest all the claim limitations. See MPEP § 2143. The Examiner's indication that Idogaki discloses a need to stabilize the movement and position of the magnet is not a teaching or suggestion of a metal insert as is recited in the claim. It simply states a general desire that is

unrelated to any particular structure. The Examiner relies on the general statement that a person having ordinary skill in the art would utilize a metal insert, but the Examiner's assertion is unsupported. As a result, the Examiner has not provided a sufficient prima facie case of obviousness. Therefore, claims 32 and 33 are patentable over a combination of Idogaki and Iwasaki.

Conclusion

It is believed this amendment now has placed the application in condition for consideration and allowance. If necessary, the Commissioner is hereby authorized in this and concurrent replies to charge payment (or credit any overpayment) to Deposit Account No. 50-0683 of Luce, Forward, Hamilton & Scripps.

Respectfully submitted,

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Date



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